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Considering the Impact of Aerosols on High Resolution FTS Measurements

Aerosols and clouds can significantly impact spaceborne infrared measurements. The impact of aerosols is limited except in cases of large volcanic eruptions, extreme dust events, or extraordinary anthropogenic emissions. Clouds may frequently be optically thick at infrared wavelengths.

In the study presented here, we have conducted radiative transfer simulations with models that include multiple scattering. These simulations were focused on the ~~the~~ impact of aerosols on nadir and limb thermal emission measurements. Volcanic aerosols, dust, and clouds were inserted into the model with appropriate vertical profiles and optical characteristics.

For nadir viewing geometry, volcanic aerosols change the upward dwelling radiances by less than two percent, with a unique spectral signature of sulfuric acid. Dust can also impact radiance by this magnitude, but there is no identifiable spectral signature. Cloud impacts can be very large and are sensitive to the description of optical properties.

Simulations are underway to assess the impact of aerosol on limb measurements.